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# Service Manual

## 163H MOTOR GRADER

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Product: MOTOR GRADER
Model: 163H MOTOR GRADER ARL
Configuration: 163H Motor Grader ARL00001-UP (MACHINE) POWERED BY 3176C Engine

**Disassembly and Assembly**
**143H and 163H Motor Graders Power Train**

**Media Number -RENR4139-07** **Publication Date -01/03/2008** **Date Updated -01/04/2008**

i04398354

# Spindle - Install

**SMCS -** 4205-012; 4350-012

# Installation Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 1P-0510 | Driver Gp | 1 |
| C | 138-7576 | Link Bracket | 2 |
| | 1U-9199 | Lever Puller Hoist | 1 |
| D | 8J-8089 | Spacer | 1 |
| | 1H-3109 | Leg | 2 |
| | 360-6965 | Hydraulic Puller | 1 |
| | 1U-5230 | Hand Hydraulic Pump | 1 |
| | 1H-3107 | Push-Puller Tool Gp | 1 |
| E | 5P-2145 | Adapter | 1 |
| | 4C-9633 | Tool Stud | 1 |
| | 9U-6833 | Nut | 1 |
| | 5P-8250 | Hard Washer | 1 |
| | 9U-6600 | Hand Hydraulic Pump | 1 |
| | 360-6965 | Hydraulic Puller | 1 |

**Note:** Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Wiping cloths or rags should not be used to dry parts. Lint may be deposited on the parts which may cause later trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement.

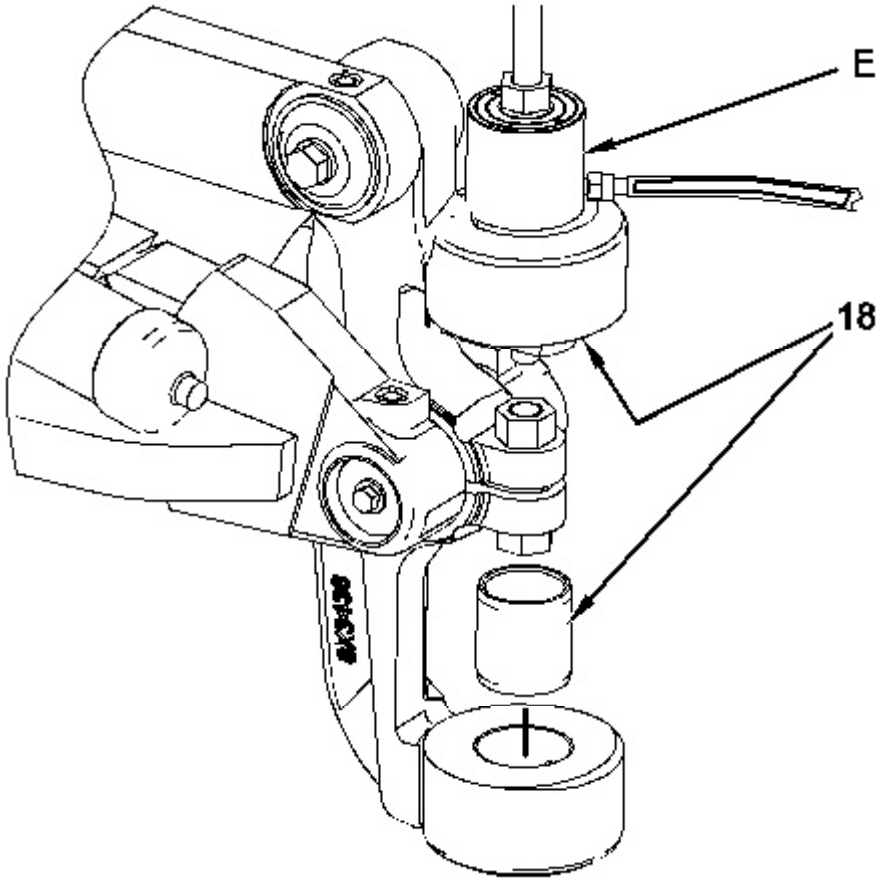


Illustration 1 g02577559

1. Lower the temperature of bearings (18) . Use Tooling (E) in order to install bearings (18) .

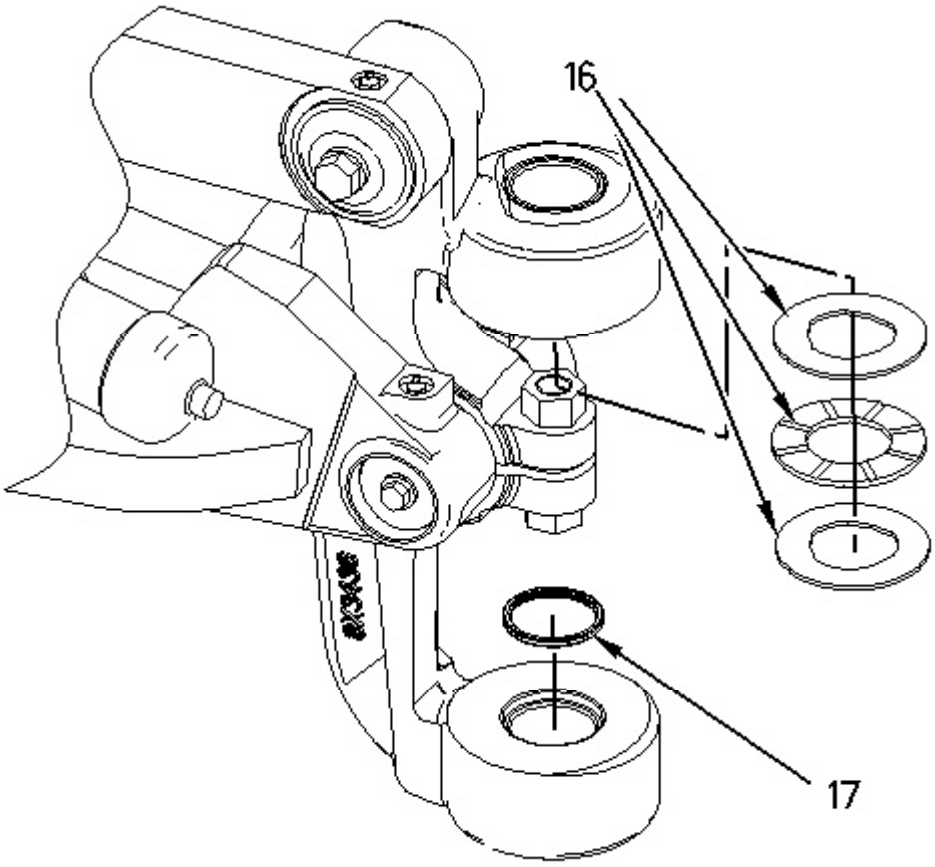


Illustration 2 g01005798

2. Use Tooling (A) in order to install seal (17) . Install thrust washers (16) .

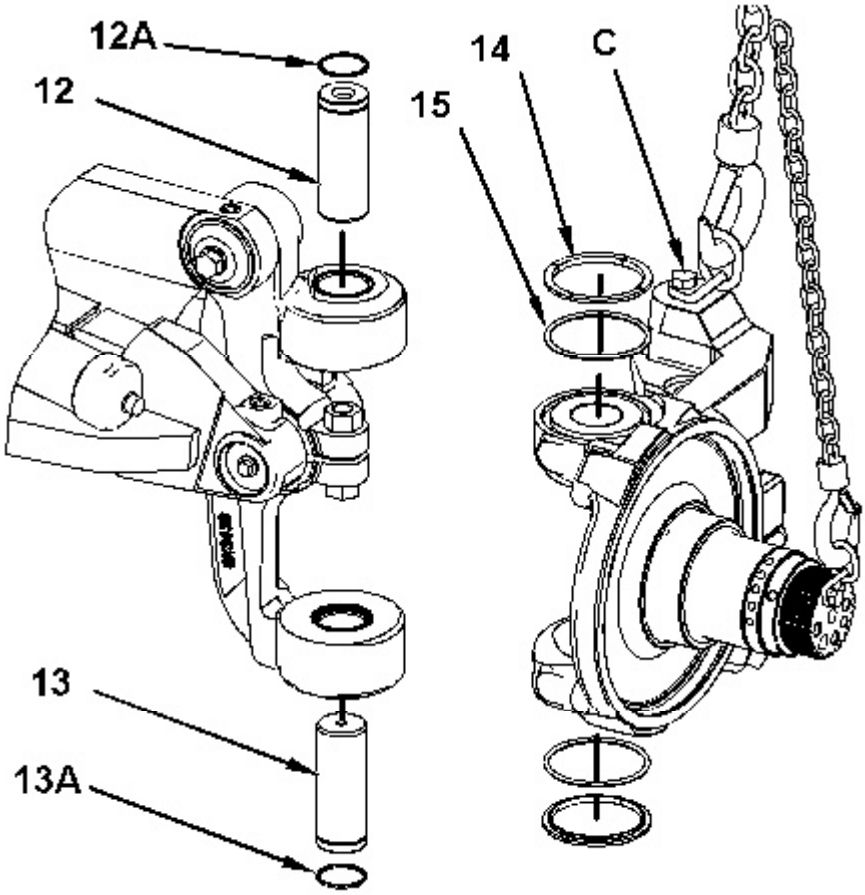


Illustration 3 g02577576

3. Attach Tooling (C) and a suitable lifting device to the wheel spindle. Install O-ring seals (15) and seals (14) . Lower the temperature of pins (12) and (13) . Install rings (12A) and (13A) on pins (12) and (13) .

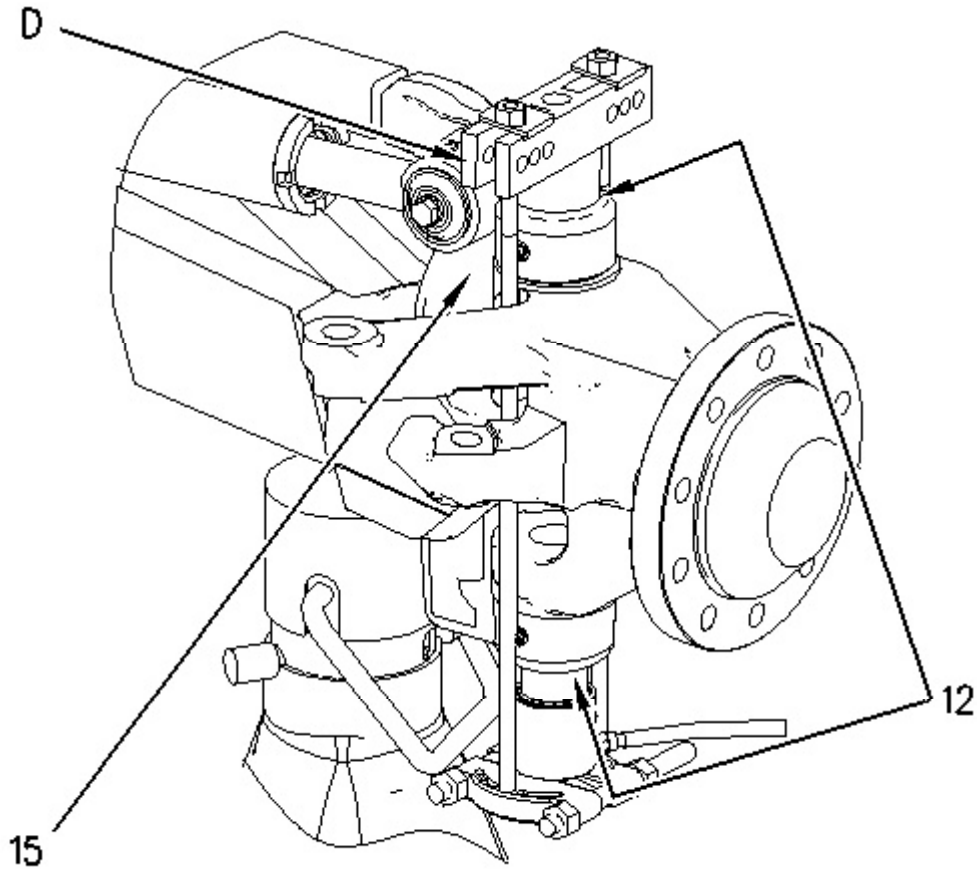


Illustration 4 g02577597

Lifting device was removed for clarity.

4. Install wheel spindle (11) . The weight of wheel spindle (11) is approximately 68 kg (150 lb). Use Tooling (D) in order to install pins (13) and (12) . Pins (13) and (12) must protrude to a dimension of 2 ± .5 mm (0.08 ± 0.02 inch).

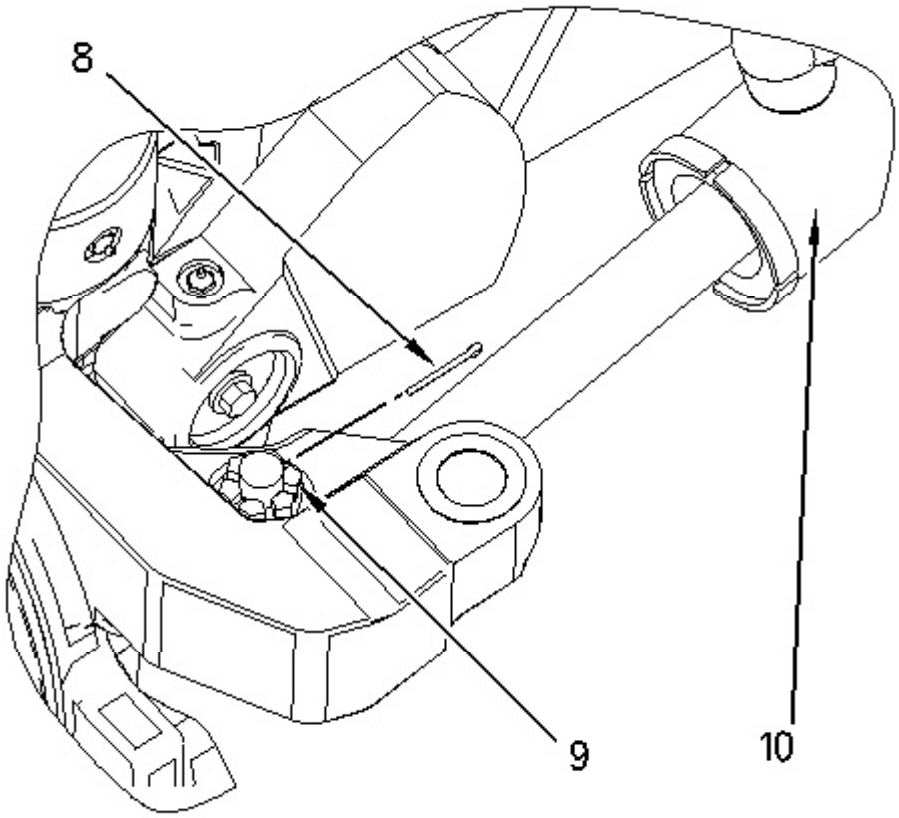


Illustration 5 g01005788

5. Position steering cylinder (10) to the original location.
6. Install nut (9) . Tighten nut (9) to a torque of 140 ± 14 N·m (103 ± 10 lb ft). Install cotter pin (8) .

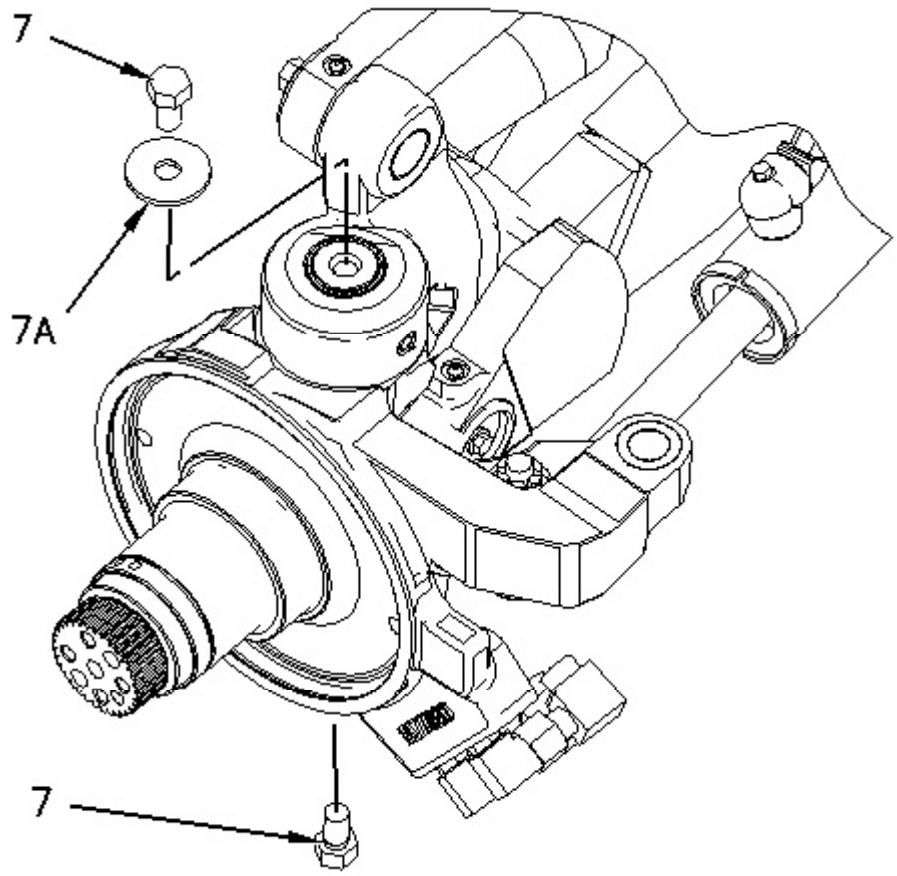


Illustration 6 g01005787

7. Install washer (7A) and bolts (7) .

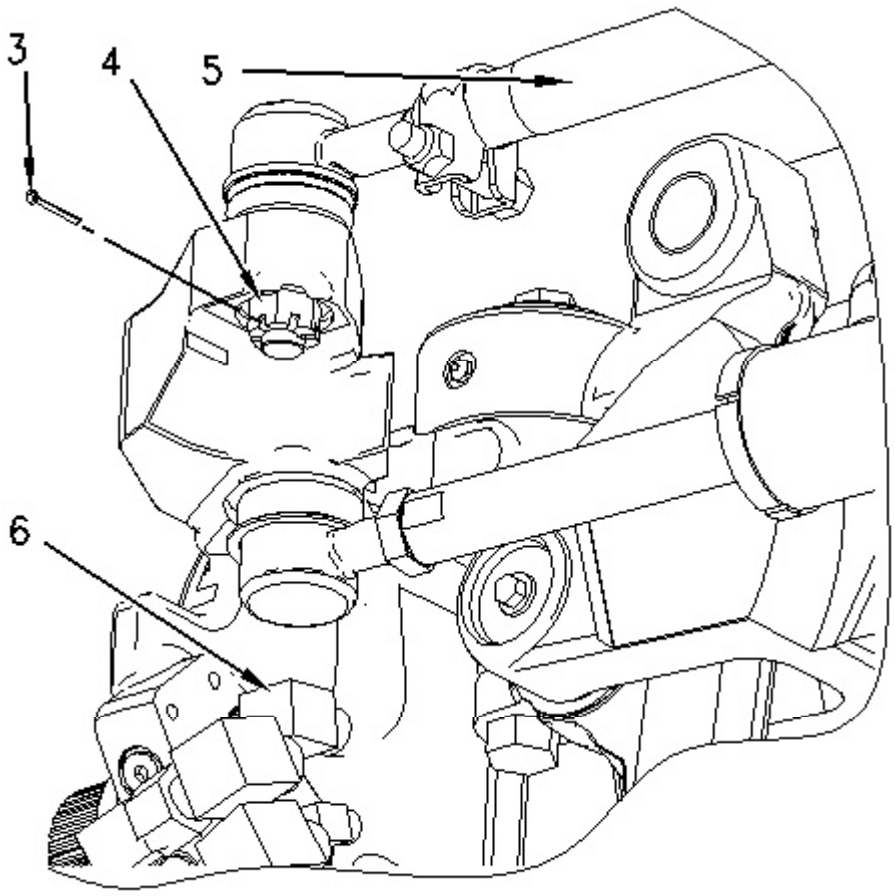


Illustration 7 g01005786

8. Position tie rod (5) to the original location. Install nut (4) . Tighten nut (4) to a torque of 140 N·m (103 lb ft). Install cotter pin (3) .
9. Install fitting (6) .

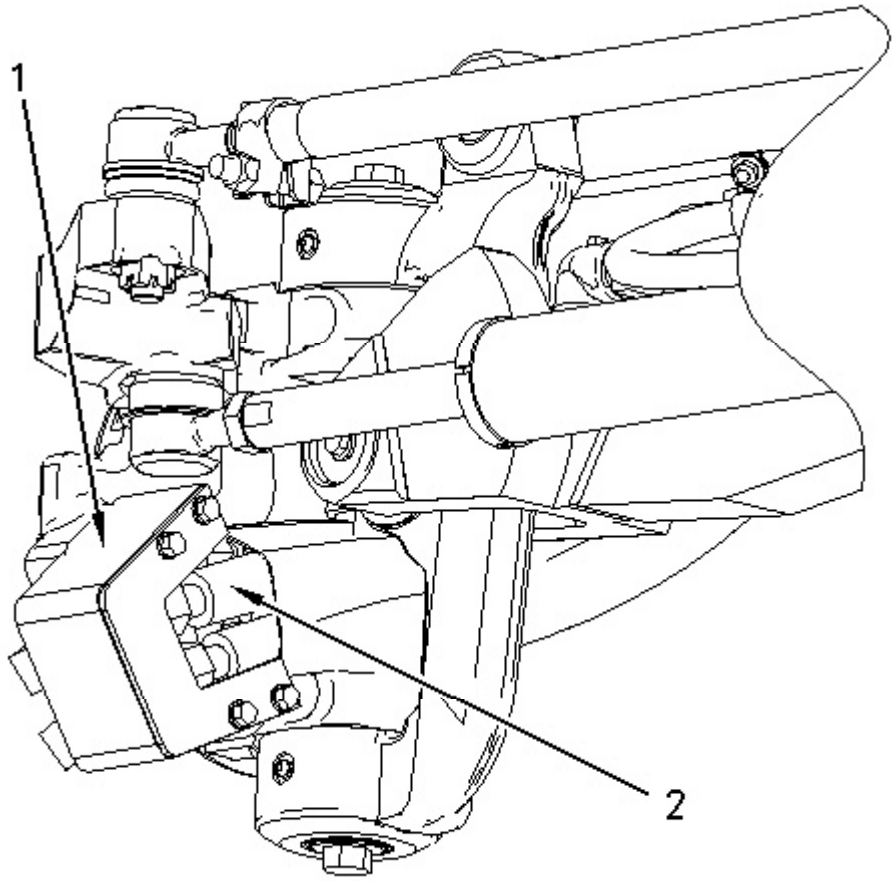


Illustration 8 g01005785

10. Connect hose assemblies (2) . Install cover (1) .

**End By:** Install the wheel bearing and the Duo-Cone Seals. Refer to Disassembly and Assembly, "Wheel, Wheel Bearing, and Duo-Cone Seals - Install".

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Product: MOTOR GRADER
Model: 163H MOTOR GRADER ARL
Configuration: 163H Motor Grader ARL00001-UP (MACHINE) POWERED BY 3176C Engine

**Disassembly and Assembly**
**143H and 163H Motor Graders Power Train**

**Media Number -RENR4139-07** **Publication Date -01/03/2008** **Date Updated -01/04/2008**

i01933259

# Spindle - Remove

**SMCS -** 4205-011; 4350-011

# Removal Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 1P-0510 | Driver Gp | 1 |
| B | 1A-5666 | Full Nut | 1 |
| C | 138-7576 | Link Bracket | 2 |
| | 1U-9199 | Lever Puller Hoist | 1 |
| D | 5P-4197 | Spacer | 1 |
| | 3H-0459 | Stud | 1 |
| | 5P-5247 | Hydraulic Puller | 1 |
| | 1U-5230 | Hand Hydraulic Pump | 1 |
| ZZ | 6V-9511 | Face Seal Plug | 2 |
| | 6V-9832 | Cap As | 2 |
| | 6V-9508 | Face Seal Plug | 1 |
| | 6V-9829 | Cap As | 1 |
| | 6V-9510 | Face Seal Plug | 1 |
| | 6V-9831 | Cap As | 1 |

**Start By:**

A. Remove the wheel bearing and the Duo-Cone Seals. Refer to Disassembly and Assembly, "Wheel, Wheel Bearing and Duo-Cone Seals - Remove".

**Note: SERVICE DATA: TOOLING (ZZ) WILL NOT BE IDENTIFIED IN PHOTOGRAPHS IN THE REMOVAL OR THE INSTALLATION. THIS TOOLING IS SHOWN IN ORDER TO ASSIST THE EXPERIENCED SERVICEMAN.**

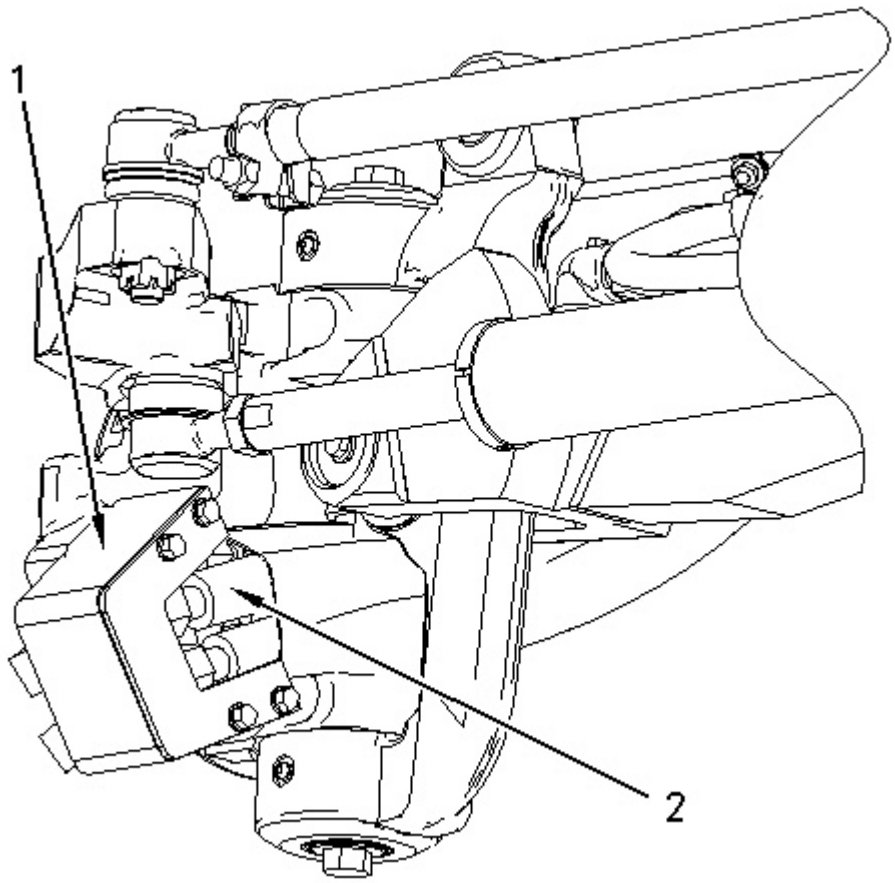


Illustration 1 g01005785

1. Remove cover (1). Disconnect hose assemblies (2) .

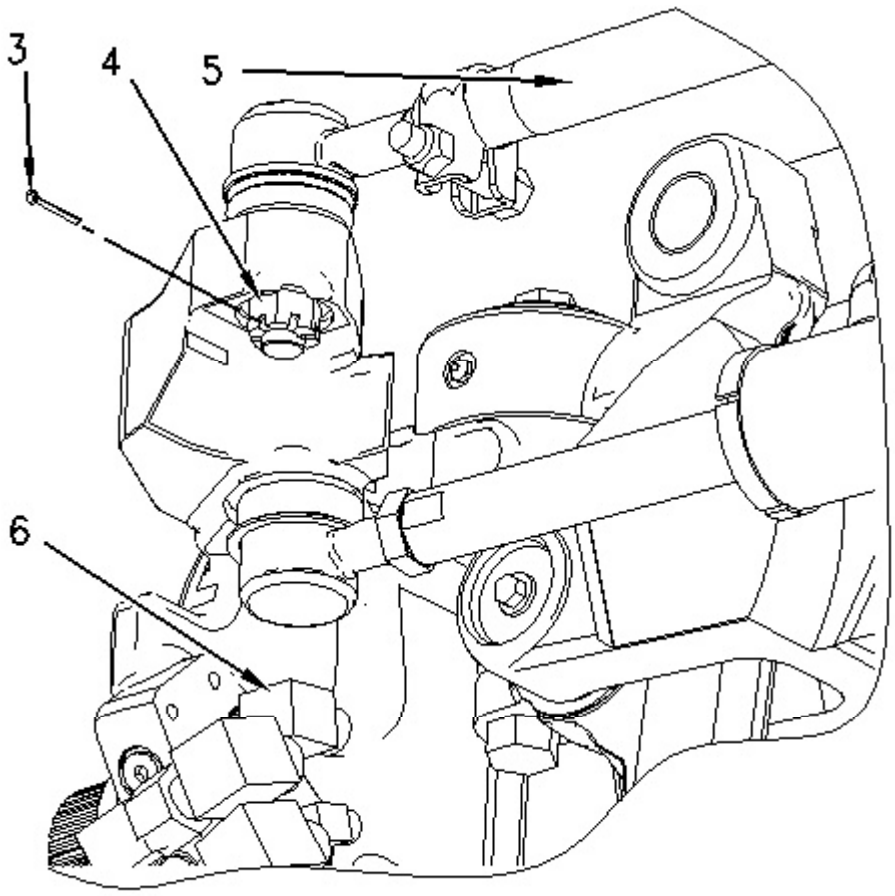


Illustration 2 g01005786

2. Remove cotter pin (3) and nut (4). Install Tooling (B) and strike with a hammer in order to break the taper.

   **Note:** Keep the washers.

3. Position tie rod (5) out of the way.

4. Remove fitting (6) .

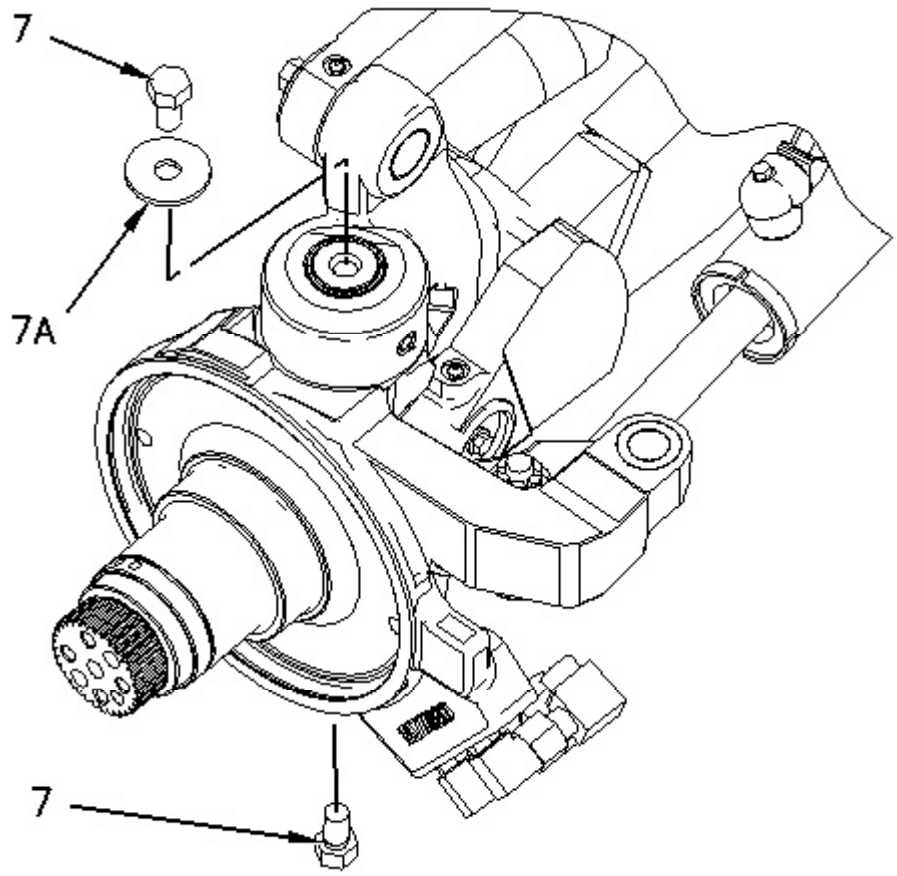


Illustration 3 g01005787

5. Remove bolts (7) and remove washer (7A) .

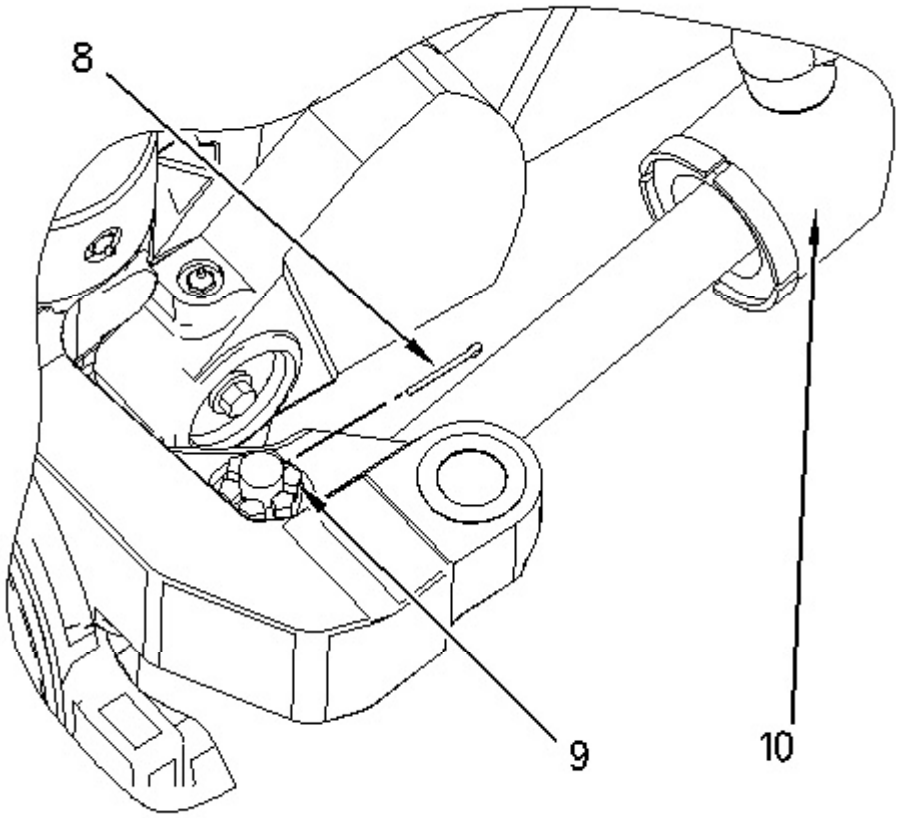


Illustration 4 g01005788

6. Remove cotter pin (8) and nut (9). Install Tooling (B) and strike with a hammer in order to break the taper.
7. Position steering cylinder (10) out of the way.

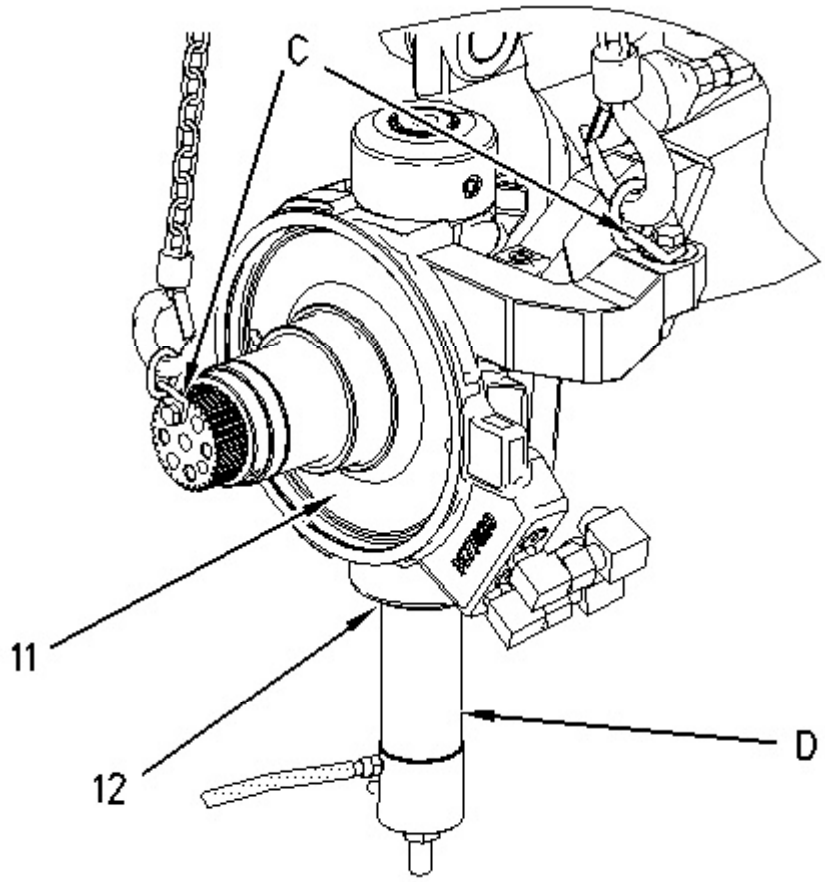


Illustration 5 g01005789

8. Attach Tooling (C) and a suitable lifting device to wheel spindle (11) .
9. Use Tooling (D) in order to remove pin (12).

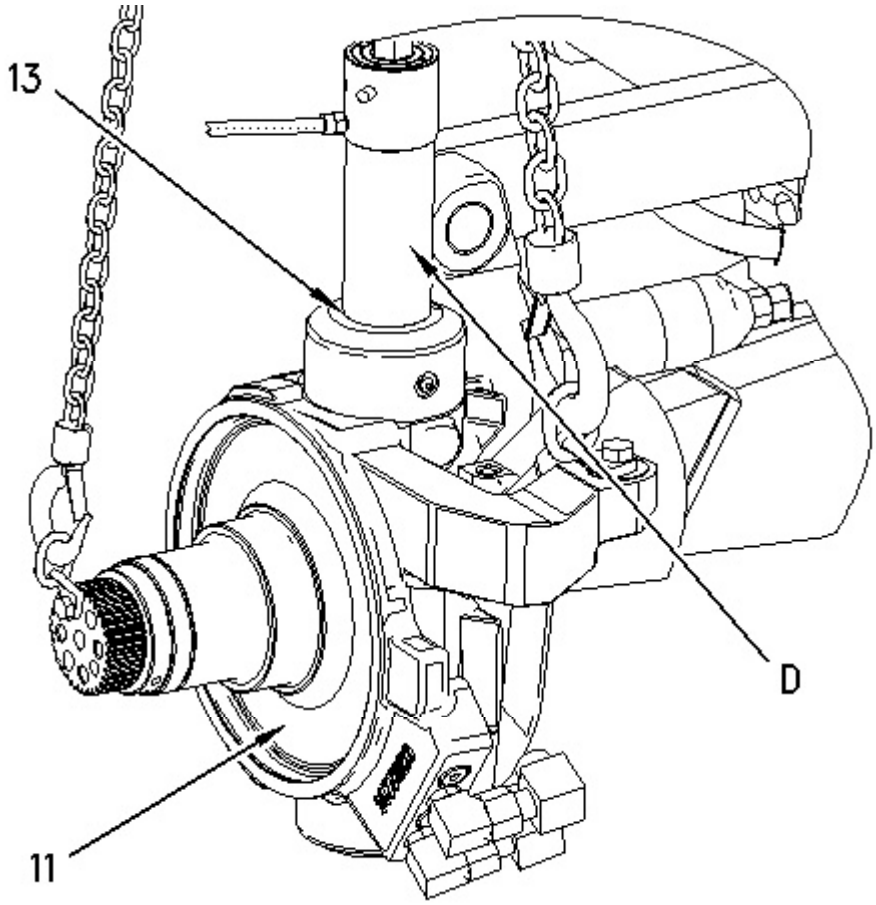


Illustration 6 g01005794

10. Use Tooling (D) in order to remove pin (13). Remove the ring from pin (13). Remove wheel spindle (11). The weight of wheel spindle (11) is approximately 68 kg (150 lb).

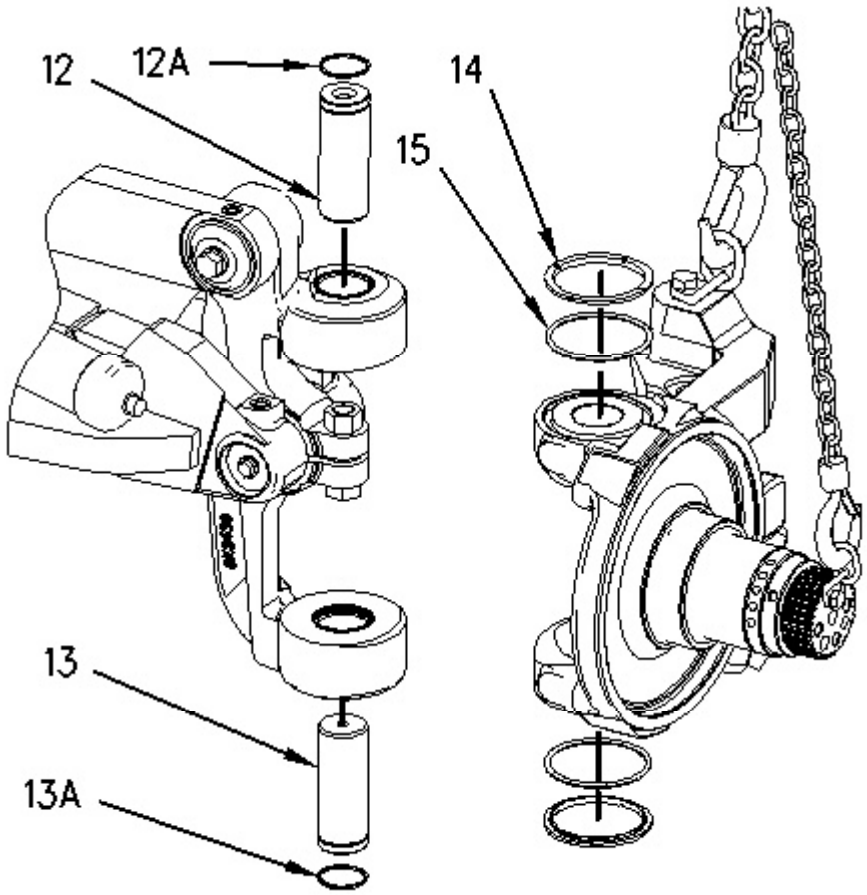


Illustration 7 g01006024

11. Remove seals (14) and O-ring seals (15). Remove rings (12A) and (13A) from pins (12) and (13) .

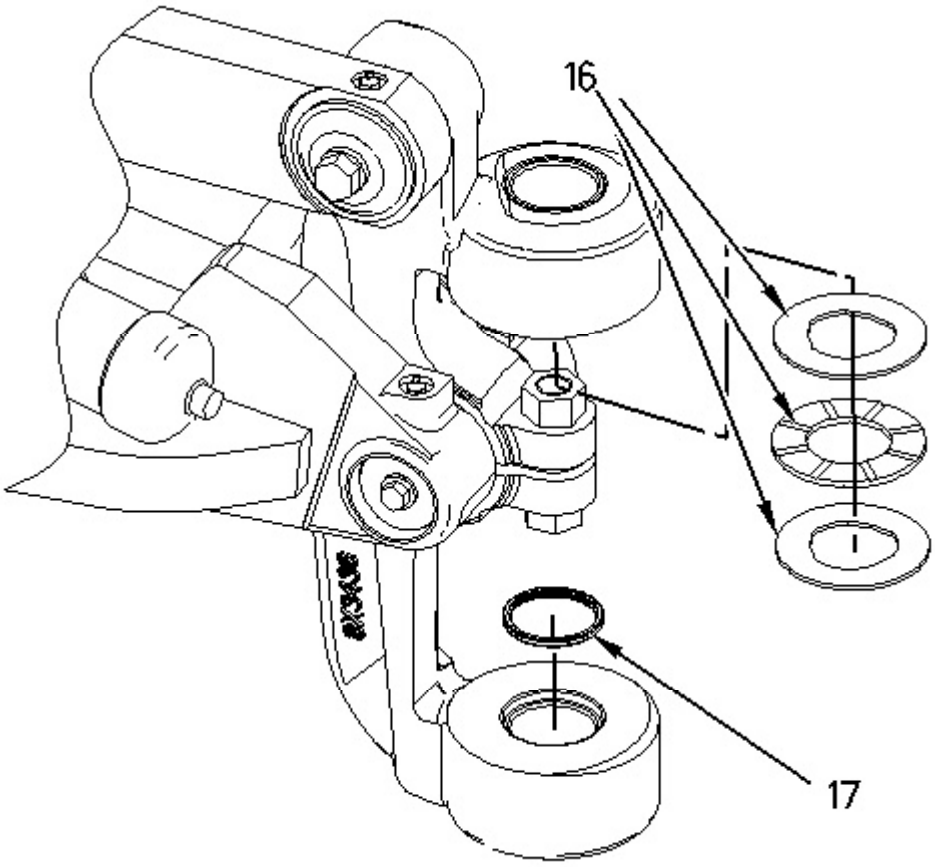


Illustration 8 g01005798

12. Remove thrust washers (16) and seal (17) .

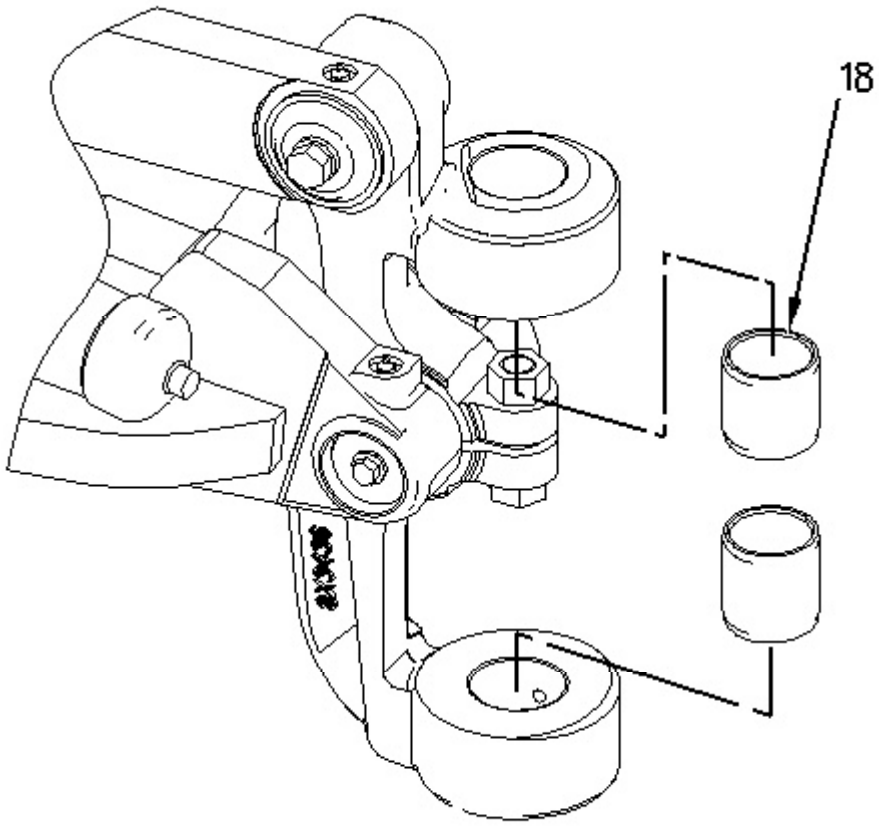


Illustration 9 g01005799

13. Use Tooling (A) in order to remove bearings (18) .

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Configuration: 163H Motor Grader ARL00001-UP (MACHINE) POWERED BY 3176C Engine

**Disassembly and Assembly**
**143H and 163H Motor Graders Power Train**
**Media Number -RENR4139-07** **Publication Date -01/03/2008** **Date Updated -01/04/2008**

i01929399

# Wheel (Bearings and Duo-Cone Seal) - Install

**SMCS -** 4208-012; 4350-012

## Installation Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 138-7576 | Link Bracket | 1 |
| B | 4C-8155 | Spanner Wrench As | 1 |
| C | 1U-6434 | Duo-Cone Seal Installer As | 1 |
| | 169-0503 | Installation Kit | 1 |

**Note:** Cleanliness is an important factor. Before assembly, all parts should be thoroughly cleaned in cleaning fluid. Allow the parts to air dry. Wiping cloths or rags should not be used to dry parts. Lint may be deposited on the parts which may cause later trouble. Inspect all parts. If any parts are worn or damaged, use new parts for replacement.

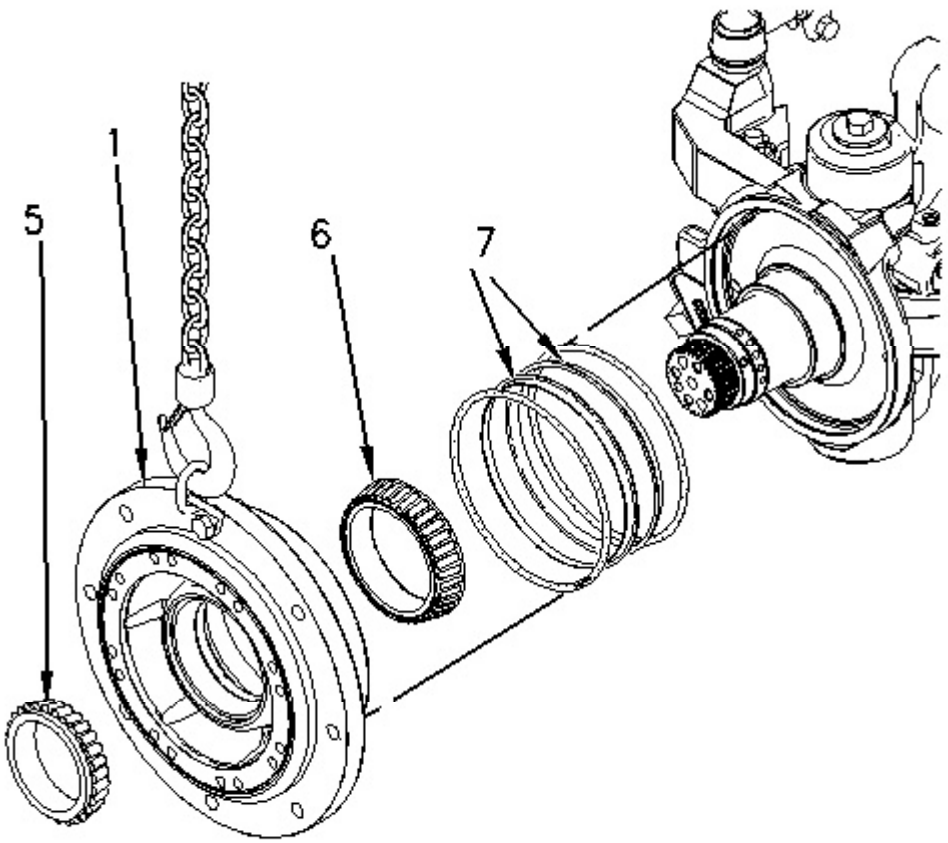


Illustration 1 g01003903

1. Use Tooling (C) in order to install Duo-Cone seal (7). Refer to Disassembly and Assembly, "Duo-Cone Conventional Seals - Install".

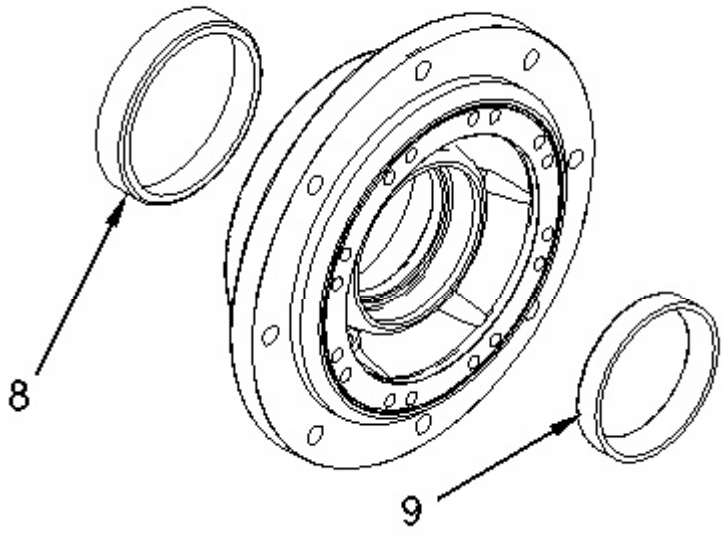


Illustration 2 g01003904

2. Lower the temperature of bearing cup (9). Install bearing cup (9). Lower the temperature of bearing cup (8). Install bearing cup (8) .

3. Raise the temperature of bearing cone (6). Install bearing cup (6). Use Tooling (C) in order to install Duo-Cone seal (7). Install Duo-Cone seal (7). Refer to Disassembly and Assembly, "Duo-Cone Conventional Seals - Install".

4. Attach Tooling (A) to wheel (1). Install wheel (1). The weight of wheel (1) is approximately 68 kg (150 lb). Install bearing cone (5) .

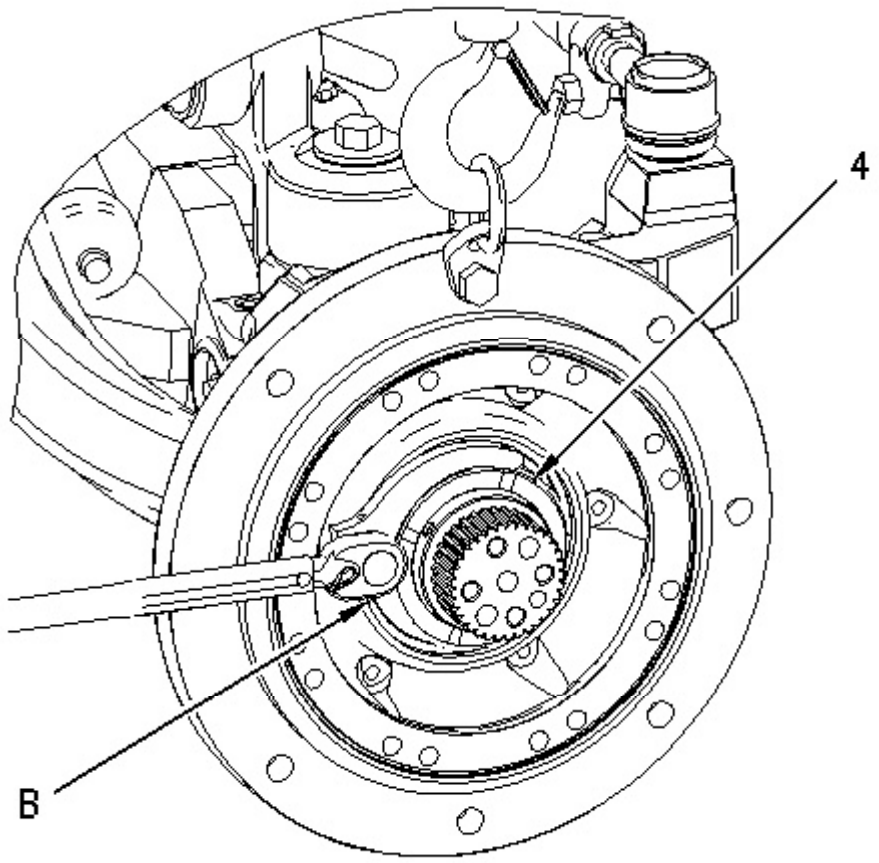


Illustration 3 g01003732

5. Install nut (4). Use Tooling (B) in order to tighten nut (4) to a torque of 136 N·m (100 lb ft). Align the hole in nut (4) with the closest hole in the spindle.

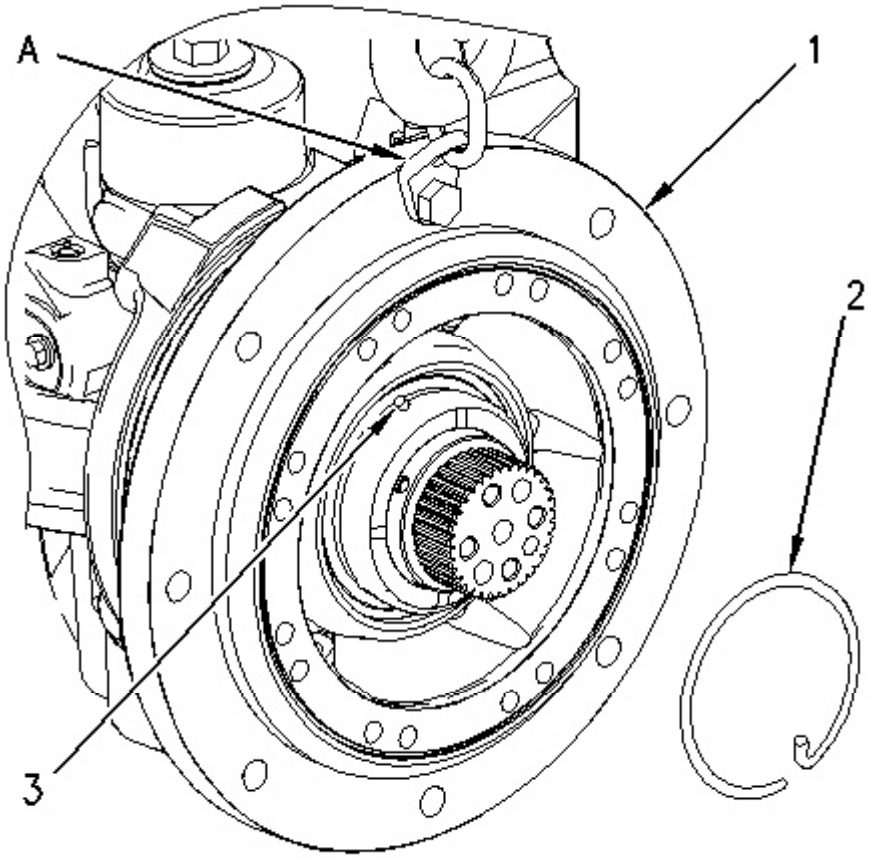


Illustration 4 g01003705

6. Remove Tooling (A) from wheel (1). The weight of wheel (1) is approximately 685 kg (150 lb).
7. Install dowel (3) .
8. Install ring (2) .

**End By:** Install the piston motor (all wheel drive). Refer to Disassembly and Assembly, "Piston Motor (All Wheel Drive) - Install".

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**Disassembly and Assembly**
**143H and 163H Motor Graders Power Train**
**Media Number -RENR4139-07** **Publication Date -01/03/2008** **Date Updated -01/04/2008**

i01929398

# Wheel (Bearings and Duo-Cone Seal) - Remove

**SMCS -** 4208-011; 4350-011

# Removal Procedure

Table 1

| Required Tools | | | |
|---|---|---|---|
| **Tool** | **Part Number** | **Part Description** | **Qty** |
| A | 138-7576 | Link Bracket | 1 |
| B | 4C-8155 | Spanner Wrench As | 1 |

**Start By:**

A. Remove the piston motor (all wheel drive). Refer to Disassembly and Assembly, "Piston Motor (All Wheel Drive) - Remove".

**Note:** Cleanliness is an important factor. Before the disassembly procedure, the exterior of the component should be thoroughly cleaned. This will help to prevent dirt from entering the internal mechanism.

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